



Pollution Identification and Correction

A Public Health Approach to Low Dissolved Oxygen in
Hood Canal

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“The mission of the Pollution Identification and Correction Program is to protect the public from waterborne illness and other water quality related hazards.”





Successful Clean Water Programs:

Political support

Stable funding source

Standard procedure

Effective public outreach

Enforcement capability

Consistent follow-up

Kitsap's PIC Program:

Storm water utility

PIC Priority/Protocols

Proactive education

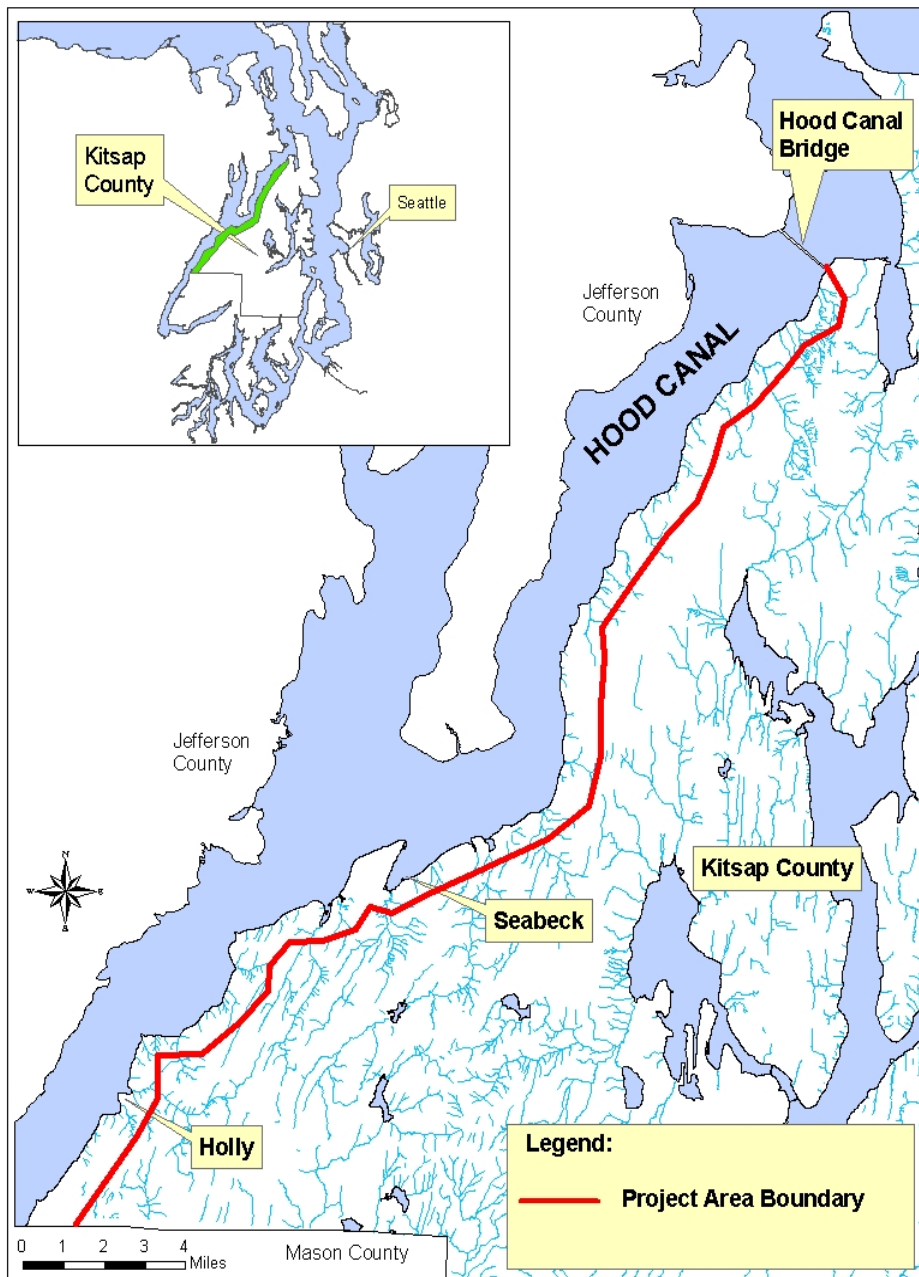
Enforcement capability

Consistent follow-up

- 
- The background of the slide is a photograph of a calm body of water, likely a lake or bay. In the distance, a white sailboat with a single mast is visible on the water. The shoreline is lined with dense evergreen trees. In the foreground, several ducks are perched on a wooden log that extends into the water. The sky is overcast with soft, grey clouds.
- Documented problem
 - Communication
 - Respect
 - Convenience

PIC Participation Rates

Burley Creek (1999-2002)	92%
Dyes Inlet sw (2006-2009)	100%
Kitsap Lake (2003-2005)	94%
Long Lake (1998)	82%
Port Gamble Bay (2001)	83%
Yukon Harbor (2003-2006)	93%



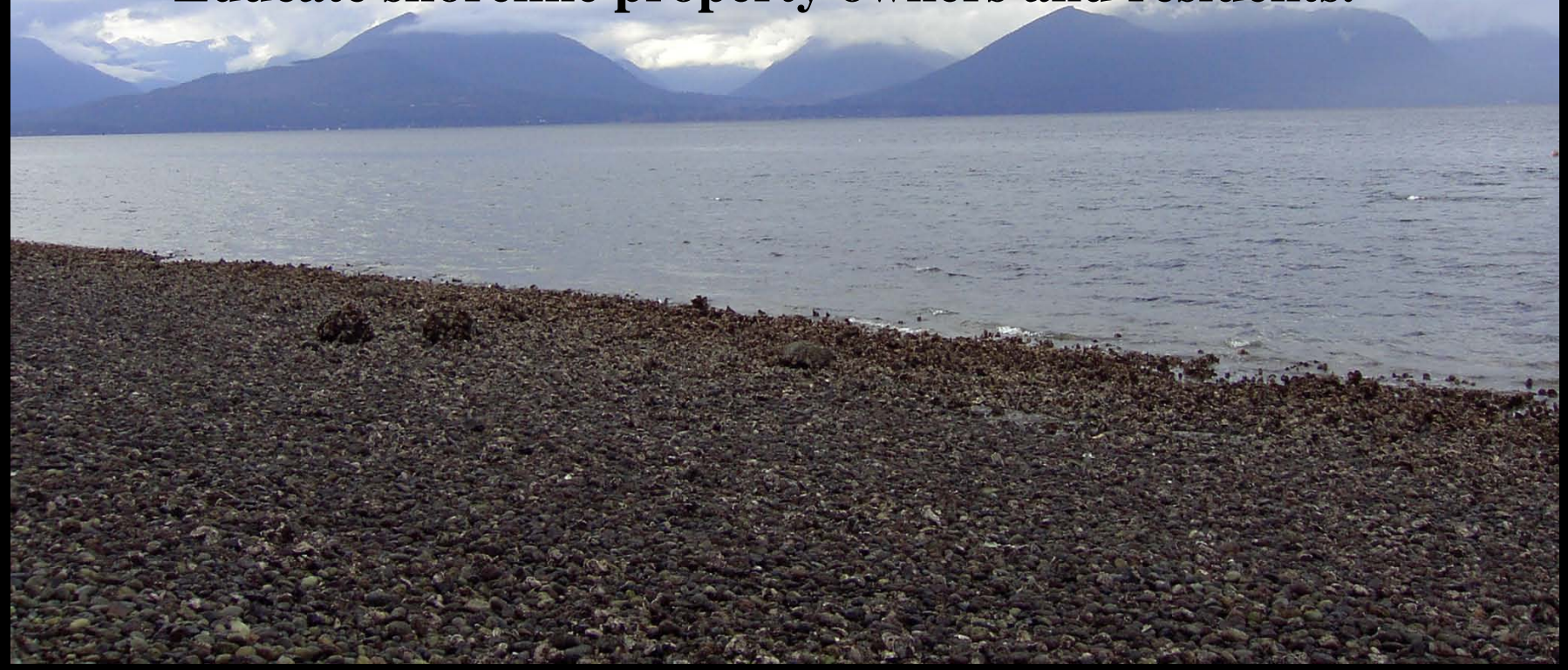
Upper Hood Canal

Pollution Identification and Correction

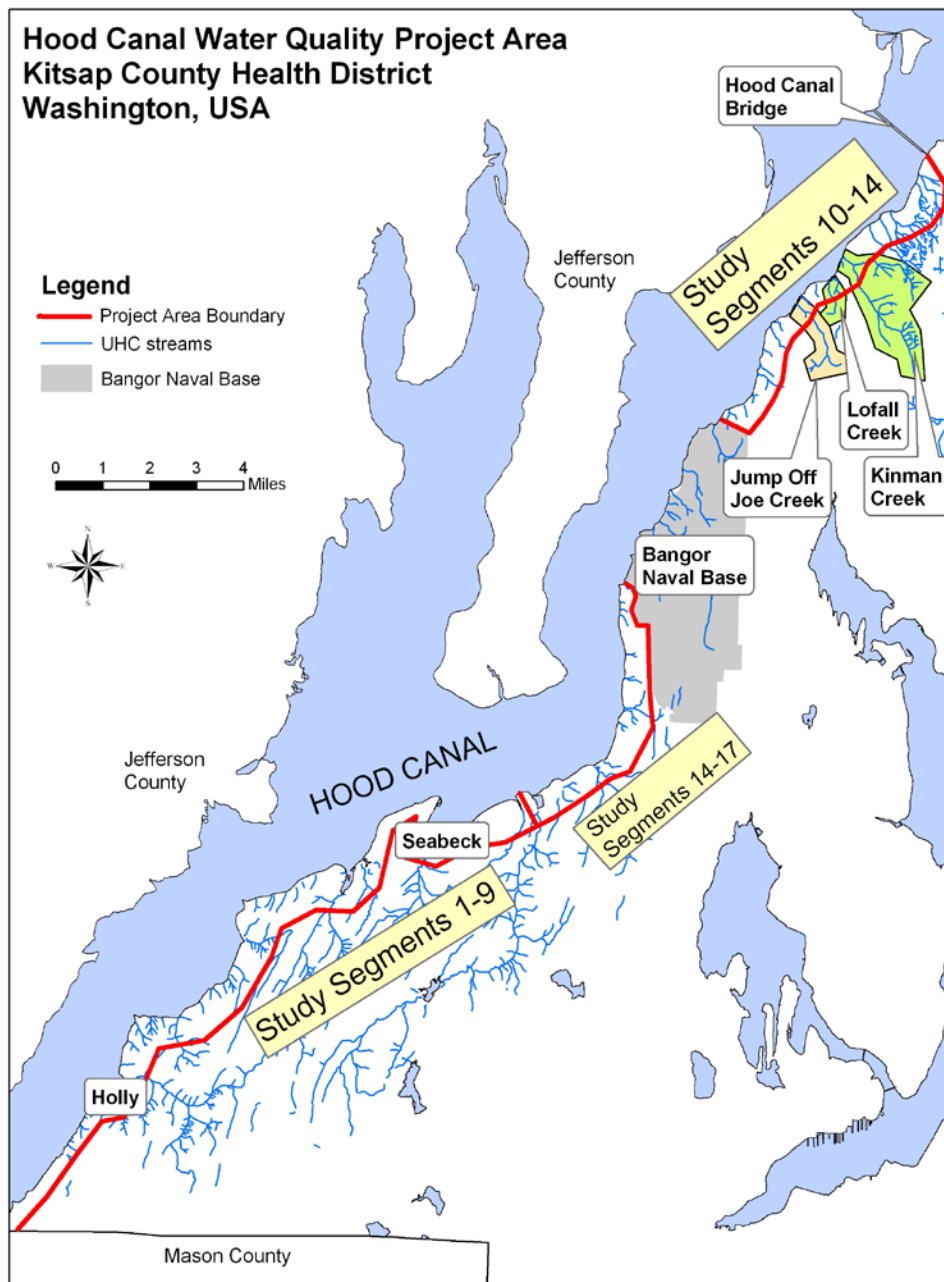


Public Health Approach

- **Find and fix OSS failing to the Hood Canal shoreline.**
- **Determine if correcting failing OSS nets reduction of nutrients to the shoreline.**
- **Educate shoreline property owners and residents.**



Hood Canal Water Quality Project Area
Kitsap County Health District
Washington, USA

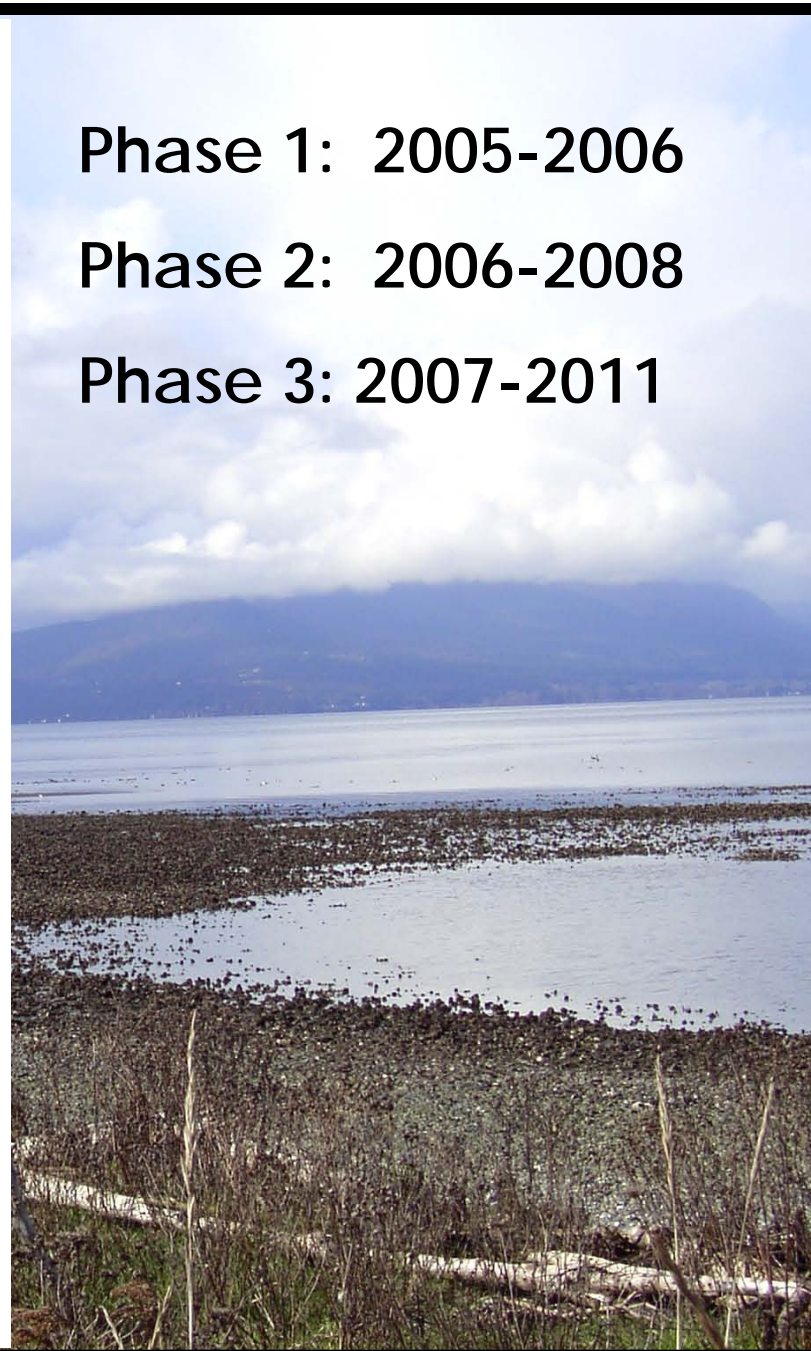



UHC/Northern Shoreline PIC/QAPP map B

Phase 1: 2005-2006

Phase 2: 2006-2008

Phase 3: 2007-2011



- 
- **Shoreline Evaluation**
 - **Lofall, Kinman, Jump Off Joe, and Vinland Creek Parcel Evaluation**
 - **Pilot Nutrient Project**

Project Components



Shoreline Evaluation

Surveyed approximately 33 miles of
developed shoreline during wet and dry
weather seasons

Fecal coliform

Flow

GPS

Photo

Description



The background of the slide is a photograph of a calm lake. In the distance, there are blue-toned mountains under a hazy sky. A red survey marker or buoy is visible in the water in the lower-middle part of the image.

Lofall, Kinman, Jump Off Joe, and Vinland

Parcel Evaluations

Contact owner/occupant.

Conduct informational interview.

**Obtain access and consent to field inspect
OSS and other potential fecal sources.**

Sample and dye test as necessary.

Consistent follow-up

Pilot Nutrient Discharge Study - Methods

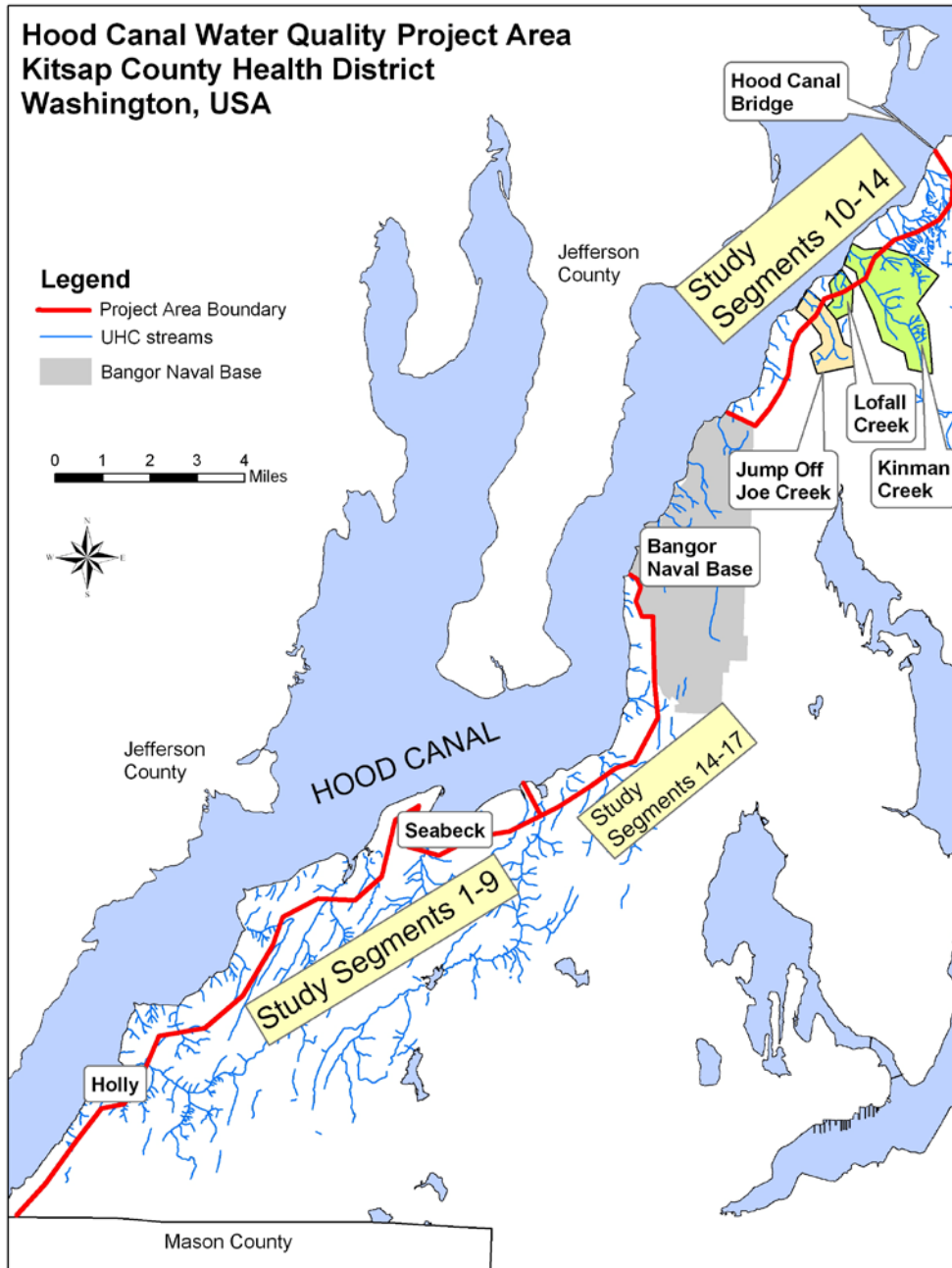
**Correlation study - Fecal coliform (FC)
and Nitrate+nitrite nitrogen:**

- Collect paired samples from
developed and undeveloped shoreline**

**Before and After FC source correction
Study:**

- Collect fecal and nutrient samples
before and after correction to
determine net nutrient reduction.**

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Washington, USA**



UHC/Northern Shoreline PIC/QAPP map B

2005-6 Project

(Segments 1-9 approx 15 miles)

Funded by:

**Early action funds and
Kitsap's stormwater utility**

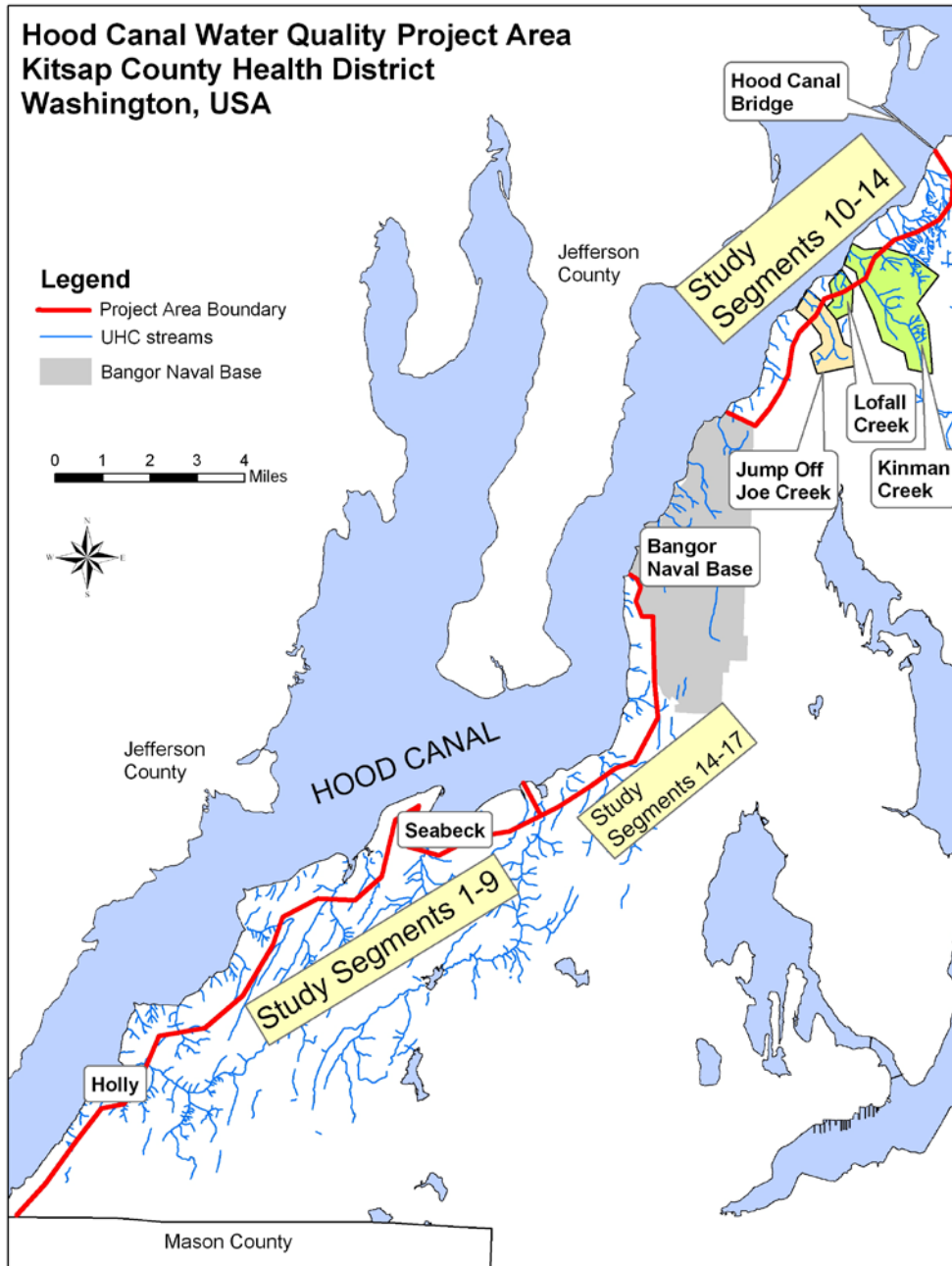
Project components:

- **Winter shoreline evaluation**
- **Pilot nutrient study**

Results:

- **18 failing OSS impacting shoreline with 340 homes found and corrected (5%)**
- **No correlation found between FC and nitrate+nitrite**

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Washington, USA**



UHC/Northern Shoreline PIC/QAPP map B

2006-8 Project

Funded by: CCWF

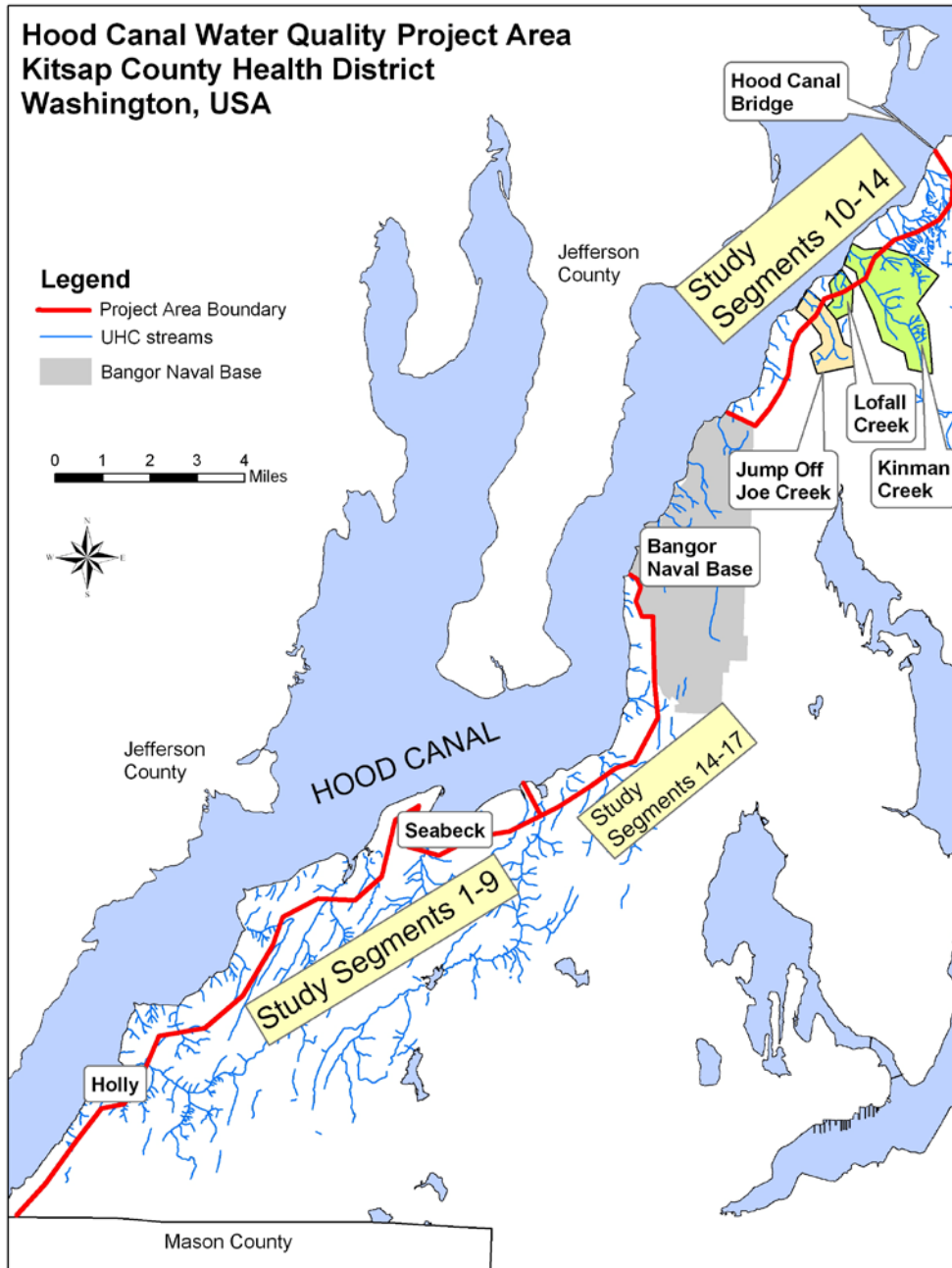
Project components:

- **Shoreline survey segments 10-17 – winter and 1-17 summer – approx 18 miles**
- **Kinman and Lofall Creeks**
- **Pilot nutrient study**

Results:

- **13 failing OSS impacting shoreline with 420 homes (3%)**
- **Statistically significant nutrient reductions after FC source correction.**

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UHC/Northern Shoreline PIC/QAPP map B

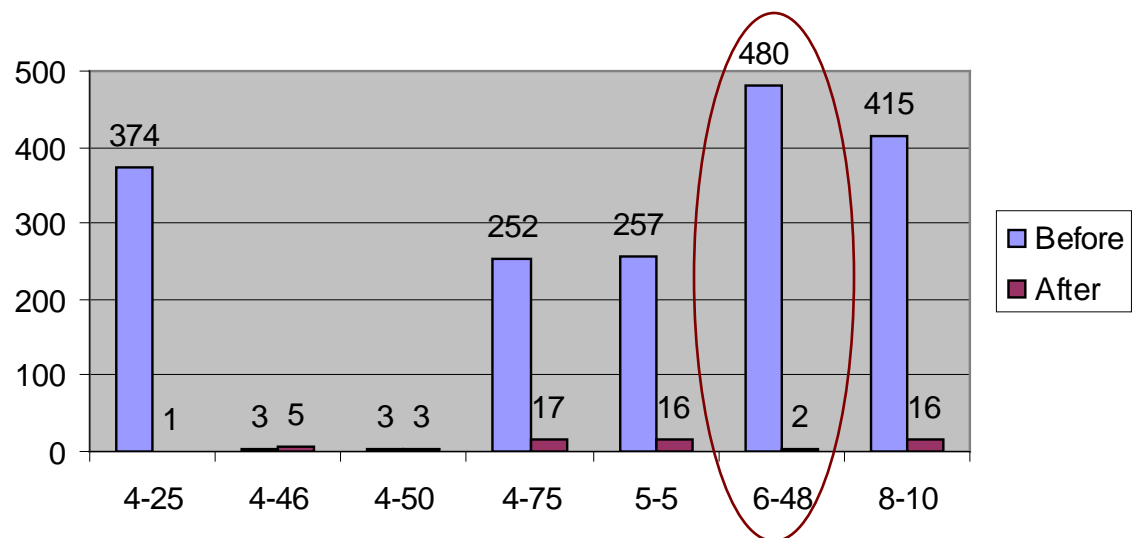
2007 – 2011 Project

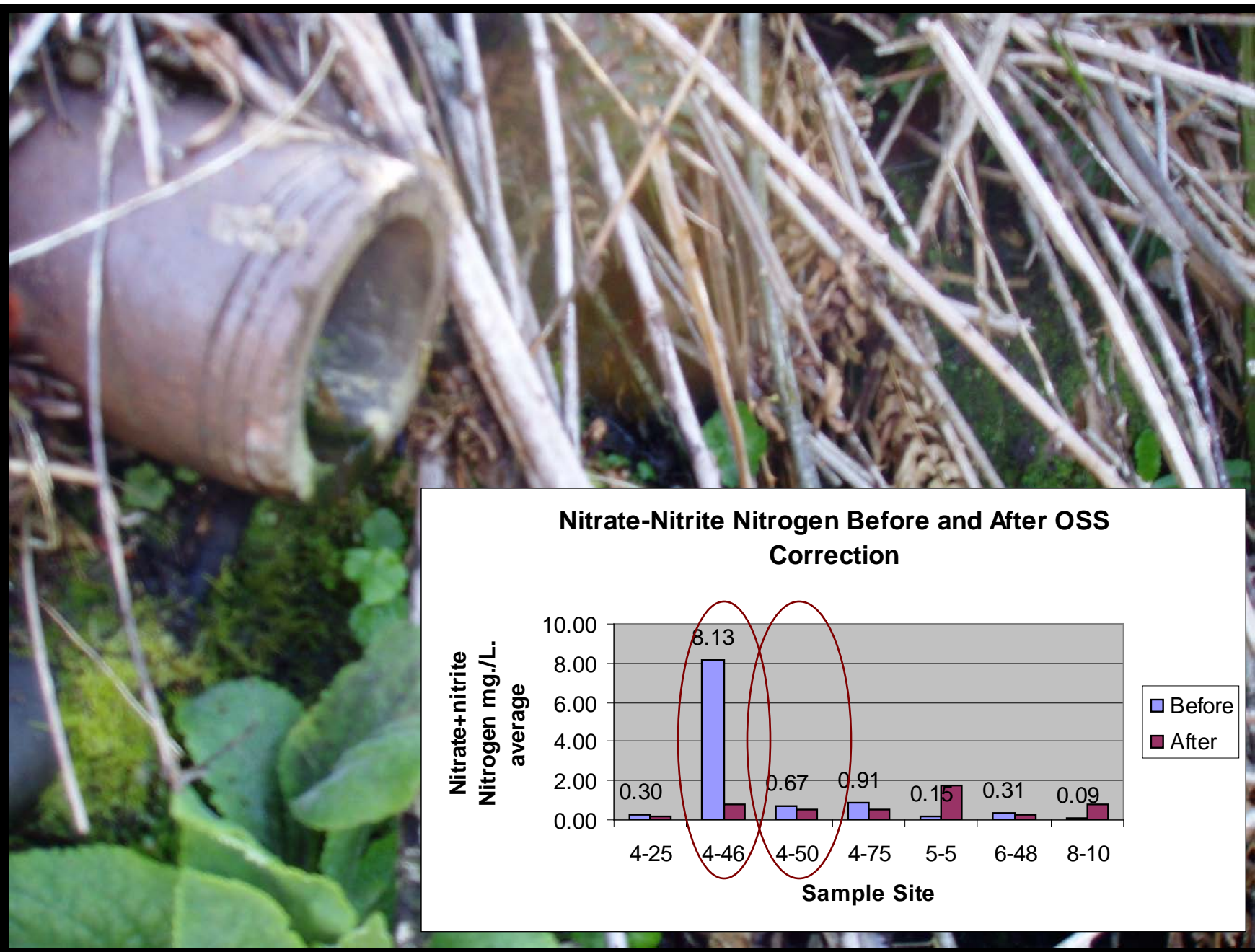
Funded by: CCWF

Project components:

- Jump Off Joe, Lofall, Kinman and Vinland Creek parcel surveys.

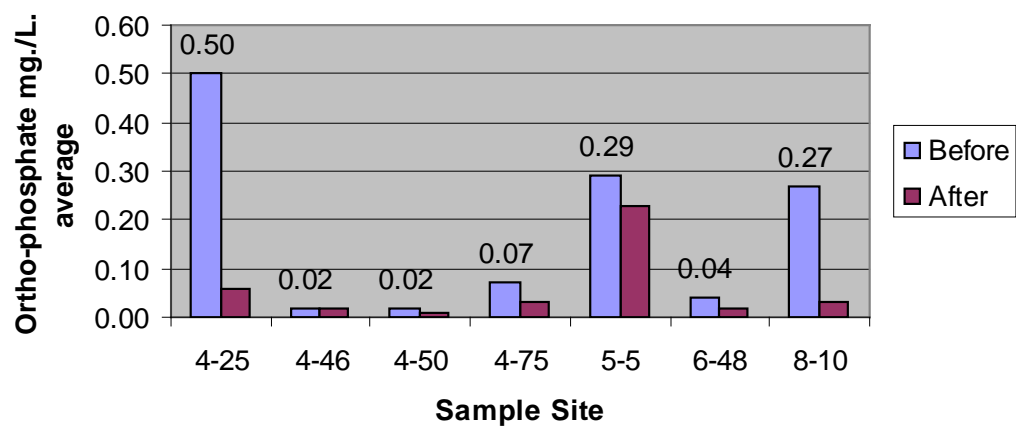
Fecal Coliform Before and After OSS Correction

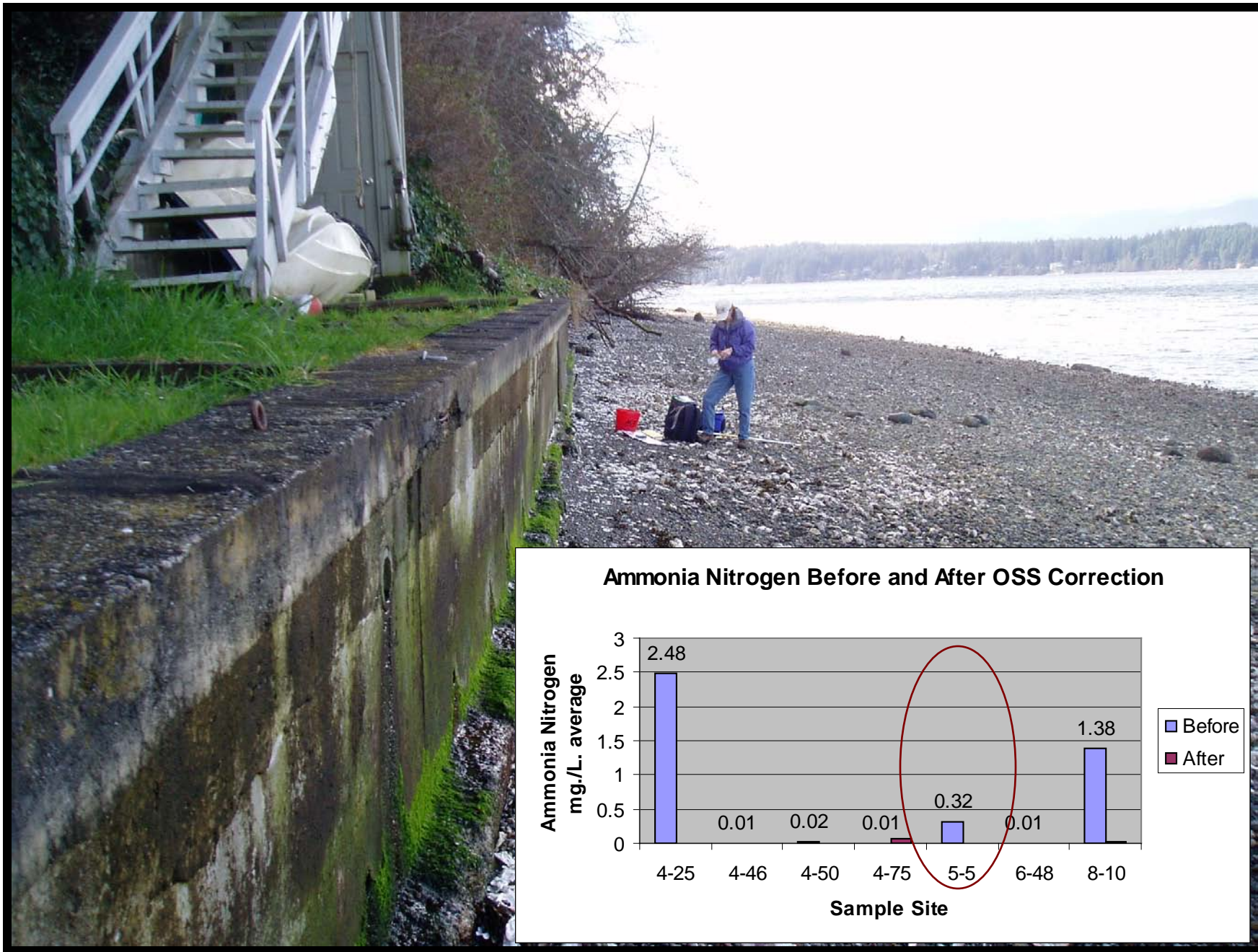






Ortho-phosphate Before and After OSS Correction





Ammonia Nitrogen Before and After OSS Correction

